Regional District of Nanaimo

Electoral Area 'H'
ALR Boundary Review: Preliminary Analysis
Final Report

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Regional District of Nanaimo

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1.0 Executive Summary

The Regional District of Nanaimo commissioned the services of Upland Agricultural Consulting Ltd. to investigate whether or not the boundary of the Agricultural Land Reserve (ALR) warrants some adjustment within Electoral Area 'H'. This report presents a set of criteria through which agricultural land within Electoral Area 'H' was analyzed, on a subarea basis, to answer questions regarding the integrity of the boundary of the ALR. In particular, the investigation served to identify knowledge gaps, explore the possibility for the Regional District to pursue a block exclusion application, and to provide other recommendations regarding ALR decision-making in Electoral Area 'H'.

The investigation included a review of background information, a historical analysis of ALR applications within Electoral Area 'H', mapping of topography and natural hazards, and a targeted ground-truthing exercise. The results of this background research is presented in the companion report *Existing Conditions Report*, submitted separately.

The criteria used to examine the ALR boundary has been developed based on the Agricultural Land Commission (ALC) process along with additional criteria applicable to Electoral Area 'H' subareas. Additional information that was readily available at the Electoral Area geographic level was also included in the analysis. These criteria included:

- Discrepancies in digital mapping information;
- ALR application history;
- Data and information obtained during the concurrent Official Community Plan (OCP) review;
- Zoning, parcel size, and land use;
- Topography and slopes;
- Soil types and agricultural capability ratings;
- Water availability and climate change;
- Agricultural suitability; and
- Input received from stakeholders.

Whenever possible, the investigation drilled down to the subarea level in order to acknowledge and accommodate nuances within the Electoral Area. The following subareas were delineated (Figure 1):

1. Deep Bay;
2. Bowser and Qualicum Bay (including ALR northeast of the Inland Island Highway);
3. Dunsmuir (including Grovehill Road, Boorman Road, Bayliss Road, and Oakdowne Road); and
4. Spider Lake (including surrounding ALR south of the Inland Island Highway).

Highlights of this investigation include the following results:

- About a third (1,213 ha or 38%) of the ALR in Electoral Area 'H' is conferred with Farm Class and is being actively farmed.
- The proportion of ALR properties with primarily residential usage is greatest within parcels that are less than 8 ha, and the proportion of ALR properties that are primarily treed and/or contain logging activity is greatest within the largest parcels (greater than 20 ha).
- Topographic information was available at a coarse resolution of 20 m contours. While there were no ALC applications for exclusion in Electoral Area 'H' based on adverse topography, site-specific topographical challenges may exist that were unable to be characterized with 20 m contours.

- The agricultural capability maps indicate a wide range of improved agricultural capability ratings in Electoral Area 'H', with the majority falling between Class 2, Class 3, and Class 4.
- The most common agricultural limitations associated with these ratings are stoniness, moisture (excessive wetness), droughtiness (need for irrigation), and smaller pockets of problems associated with soil structure.
- Future trends in climate change and agriculture suggest that more Class 4 and 5 soils, which are uniquely suited to specialty crops such as fruit trees, nut trees, and berries, will become viable over time.
- Climate change modeling indicates that shifting hydrology patterns together with warmer and drier summer conditions will create the potential for increased productivity as long as there are adequate water supplies, drainage, and irrigation infrastructure available for farming.
- Agricultural uses that may be suitable for farmland in Electoral Area 'H' include soil-based and non-soil based activities, such as forage production and pasture, greenhouses, poultry production, sheep and/or goats, tree fruits, and berry production. Non-soil based farming opportunities, such as greenhouses, mushroom farming, and land-based aquaculture, must be considered before a parcel of farmland is deemed unproductive.

This investigation determined that the criteria for meeting the requirements for a block exclusion application to the ALC have not been met. Furthermore, greater consistency in agricultural land use designations, zoning, and minimum parcel sizes are to be encouraged within the Regional District. Support for landowners struggling to succeed in the business of farming must not be overlooked, and existing resources should be disseminated to those who seek them. In parallel, non-soil based farming opportunities should be given particular attention.

Based on this analysis, nine recommendations are put forward:

Number	Recommendation
1	Do not pursue a block exclusion application for ALR in Area 'H'.
2	Continue to assess ALR applications on a case-by-case basis.
3	Consider including parcels of Crown Land in Deep Bay, Bowser, and Qualicum Bay into the ALR in order to improve the contiguousness of ALR in the region.
4	Use a consistent Agricultural Land Use designation in both the Regional Growth Strategy and Official Community Plan for all ALR in Electoral Area 'H'.
5	Create a consistent minimum lot size of 8 ha for ALR throughout Electoral Area 'H'. In parallel, support subdivision of lots greater than 20 ha when a net benefit to farming is demonstrated.
6	Partner with other levels of government and local farm organizations to disseminate information regarding existing resources and opportunities for business planning to proponents who are struggling with the business aspects of farming.
7	Require that non-soil based farming opportunities and environmental best practices be fully considered in Agrologist reports that accompany all future ALR applications being submitted to the Regional District.
8	Provide landowners who are unable or unwilling to farm with information regarding existing land tenure options (e.g. selling or leasing the farmland to potential farmers).
9	Cease forwarding ALR applications to the ALC that are based on claims of poor agricultural suitability or on challenges associated with the business aspects of agriculture.

2.0 Introduction

The objective of the preliminary analysis of the ALR Boundary Review for Electoral Area 'H' (hereafter referred to as Area 'H') is to provide increased confidence for decision-makers and landowners when determining whether certain areas should be included or excluded from the Agricultural Land Reserve (ALR). This preliminary analysis builds on the fine-tuning completed by the Agricultural Land Commission (ALC) in 1987. The purpose of this final report is to summarize the project's findings, (including identifying any 'gaps'), to determine the possibility and/or need for the Regional District of Nanaimo (hereafter referred to as the Regional District) to pursue a block application to the ALC, and to provide any other recommendations regarding ALR decision-making in Area 'H'. While this report is based on the most recent data and future scenario modeling, it is worth noting at the outset that agriculture is increasingly an innovative sector. Land that may not be considered as suitable for one agricultural purpose today may become suitable for another purpose in the near future.

3.0 Criteria for Boundary Analysis

The criteria set forth by the ALC for determining ALR review areas is used in this assessment alongside additional criteria that allow for the analysis to be conducted on a subarea basis for Area 'H'. The ALC's set of criteria include:

- Discrepancies identified through digital mapping: In order to examine possible discrepancies, the Agricultural Capability map for Area 'H' was digitized into GIS at a resolution of 1:20,000. This map was overlain with the ALR zoning, parcels with Farm Class status, and roads. Parcel-based determination of Agricultural Capability classification was out of the scope of this preliminary boundary analysis, but any obvious discrepancies in the alignment with property boundaries, water bodies, and transportation routes were noted.

- High application volume and decision history: While some neighbourhoods within Area 'H' have high numbers of ALC applications, the decision-making by the ALC has been overwhelmingly consistent. As detailed in the *Existing Conditions Report*, since 2000, most applications for exclusion or subdivision have been denied unless they can demonstrate an overall benefit to agriculture. In particular, there have been high numbers of applications arising from the Boorman Road, Whistler Road, and Fowler Road area.

- Official Community Plan Review (OCP) and other Planning Studies: As the OCP is currently under review for Area 'H', the timing for this preliminary analysis of the ALR boundary was ideal. The Agricultural Area Plan for the Regional District (2012), Agricultural Land Use Inventory (2011), and Agricultural Water Demand Model (2012) also provide important data and context for the analysis.

- Parcel size and land use: It is worthwhile to examine applications for subdivision and non-farm use that have been approved to determine if there are issues within any of the subareas related to parcel size and land use that may warrant amendments to the ALR boundary.

- Input from Agricultural Stakeholders: Stakeholders have been involved from the conception of this project through targeted mail-outs to property owners in the ALR and advertising through the OCP working group, email list, and posters. As a component of this preliminary analysis, a presentation

of the *Existing Conditions Report* was also provided to the Regional District's Agricultural Advisory Committee for discussion and feedback.

In addition to these criteria set forth by the ALC, the following five characteristics were considered in this final report as a part of the preliminary analysis in order to answer specific questions regarding agricultural suitability:

1. Zoning, Farm Class and Parcel Size: How is land designated at the provincial, regional, and local level? What is the minimum parcel size? Is there consistency for ALR landowners? How many parcels are Farm Class? Are they located within or outside of the ALR? What size are these parcels?

2. Topography: Where do steep slopes overlap with ALR? Are there areas of farmland that are unduly limited by topography?

3. Soil Types and Agricultural Capability Ratings: What are the most common soil types found in Area 'H'? What types of agricultural activities are commonly associated with these soils? What agricultural constraints or challenges may exist? What are the ratings for Agricultural Capability within Area 'H'? What are some limitations associated with the rating system? What opportunities may be missed?

4. Water Availability and Climate Change: Are there any areas that are restricted by irrigation water sources? Are there areas where drainage would be beneficial? What are some expected challenges and opportunities for climate change adaptation and mitigation? What could climate change mean for agricultural viability and feasibility?

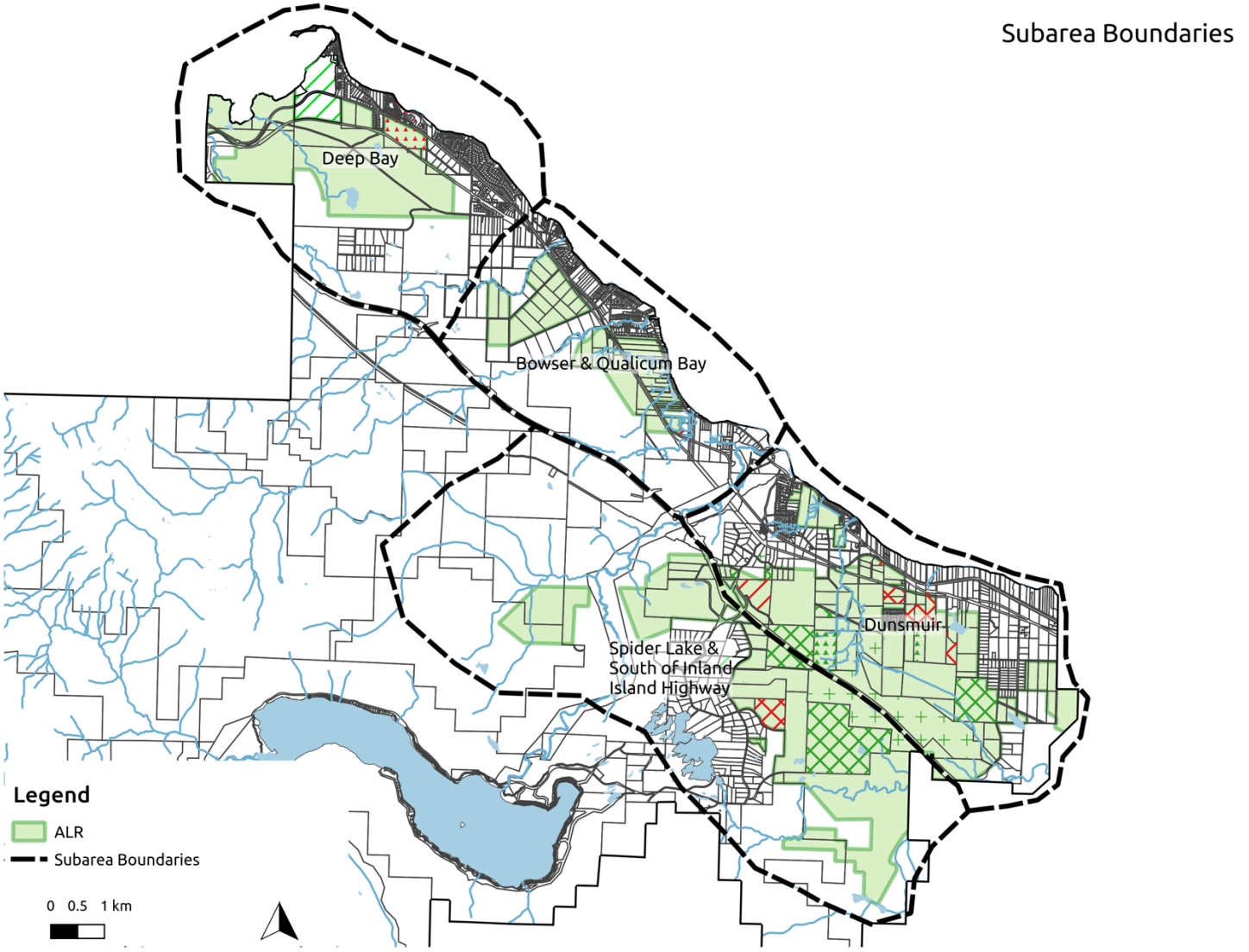
5. Agricultural Suitability: What are some soil based and non-soil based farming options for underutilized or underused farmland in Area 'H'? What activities are occurring on or near to farmland in Area 'H'?

In order to reach recommendations, these characteristics were considered in assessing the ALR boundary within Area 'H' on a sub-area (or neighbourhood) basis. The four subareas are as follows (Figure 1):

a. Deep Bay;
b. Bowser and Qualicum Bay (including ALR north of the Inland Island Highway);
c. Dunsmuir (including Grovehill Road, Boorman Road, Bayliss Road, and Oakdowne Road); and
d. Spider Lake (including surrounding ALR south of the Inland Island Highway).

Each of these subareas are considered in turn and comments that are specific to each subarea are provided whenever appropriate. Recommendations are summarized at the end of the report.

Figure 1. Area 'H' subareas considered in this assessment.



4.0 Zoning and Parcel Size

There are 3,220 ha[1] of land within the ALR that is either farmed or is available for farming in Area 'H' (Table 1). Most of the ALR parcels within Area 'H' fall within the 2 – 5 ha and 5 – 10 ha categories. This preliminary analysis found that 12% of ALR parcels were smaller than 2 ha (5 acres) in size and 39% are under 5 ha. However, the combined area of ALR parcels less than 5 ha is only 5% of the ALR.

Table 1. Parcel size distribution of land within the ALR in Area 'H' that is either farmed or available for farming.

Parcel Size	# of Parcels	% of Total Parcels	Total Area (Ha)	% of Total Area
< 2ha	21	12%	14	0.4%
2 - 5ha	48	27%	148	4.6%
5 -10ha	50	28%	387	12.0%
10-20ha	29	16%	397	12.3%
>20ha	32	18%	2274	70.6%
Total	180	100%	3220	100.0%

For a range of reasons, across much of Vancouver Island, quality agricultural land is not being farmed. This ratio is also present within Area 'H', where only about a third (1,213 ha or 38%) of the ALR is within Farm Class[2] properties (Table 2). As noted in the Agricultural Land Use Inventory (ALUI) conducted in 2012, and through a ground-truthing exercise in 2016, most of the very large ALR parcels in Area 'H' are forested. According to data provided by BC Assessment, only 37 properties claimed Farm Class status in 2015, of which 299 ha (25% of the total land covered by Farm Class) were Crown Land, most of which is located in Deep Bay[3]. Farm Class status is conferred to agricultural operations that are able to provide evidence that a minimum threshold of farm income has been generated annually. In exchange, the landowner benefits from reduced property tax rates. Nine Farm Class parcels were entirely outside of the ALR with a total area of 33.6 ha, and all of these were on parcels less than 10 ha (the average size of non-ALR Farm Class parcels is 3.7 ha). The remaining 28 properties were within the ALR (one parcel straddled the ALR boundary) and have an average size of 43.3 ha. The agricultural use associated with the large lot in Deep Bay was tree plantations.

Table 2. Size distribution of Farm Class parcels inside and outside the ALR.

Parcel Size	# of Parcels in the ALR	Amount of Ha in ALR	# of Parcels outside the ALR	Amount of Ha outside of ALR
< 2ha	0	0.0	1	0.2
2 - 5ha	10	28.1	5	12.1
5 -10ha	4	32.4	3	21.4
10-20ha	4	61.0	0	0.0
>20ha	10	1091.0	0	0.0
Total	28	1212.6	9	33.6

(Source: BC Assessment 2015)

[1] This total of 3,220 ha includes approximately 32 ha of water bodies but excludes about 187 ha of roadways.
[2] Agricultural Land Use Inventory, Ministry of Agriculture, 2012 and BC Assessment 2015 and RDN GIS data analysis.
[3] Agricultural Land Use Inventory, Ministry of Agriculture, 2012 and BC Assessment 2015 and RDN GIS data analysis.

As noted by the Agricultural Area Plan[4] and a data summary conducted by the Regional District for Area 'H'[5], as the ALR parcel size increases, the proportion of properties that are farmed increases up to a certain point (about 20 ha) and then the number of farms in production decreases. The proportion of ALR properties with primarily residential usage is greatest within parcels that are less than 8 ha, and the proportion of ALR properties that are primarily treed and/or contain logging activity is greatest within the largest parcels (greater than 20 ha).

Most ALR lands in the Regional District are included within the Regional Growth Strategy (RGS) land use designation of Resource Lands & Open Space[6]. This designation includes land that is primarily intended for resource uses such as agriculture, forestry, aggregate and other resource development; and land that has been designated for long-term open space uses. In Area 'H', 108 ha of ALR is designated as "Rural Residential" within the RGS.

ALR in Area 'H' has additional agriculture zoning, as conferred by the Regional District of Nanaimo Land Use and Subdivision Bylaw No. 500, 1987. Within this bylaw, agricultural zoning is primarily Agriculture 1 (AG-1) and Agriculture 2 (AG-2). While there are some nuances between the two zones the main difference is that primary processing is permitted in AG-2. In addition to the zoning there are Subdivision Districts associated with the zones, which indicate the minimum parcel sizes. Most parcels have 8 ha or 20 ha minimum parcel size requirements for subdivision allocated to them, with pockets of larger lots (50 ha) in Deep Bay and eastern Area 'H'. Some pockets of smaller lots (2 ha) exist in Deep Bay, Qualicum Bay, Dunsmuir, and Boorman Road areas.

Very large parcels can be prohibitive for farmers to purchase or lease, due to their high real estate value, while smaller parcels (less than 4 ha) can limit the type and viability of agricultural activities for a property. Farm parcel sizes between 8 ha and 20 ha (20 to 50 acres) are therefore ideal for both the diversity of productivity that can occur and the affordability of purchasing or leasing the land for new and emerging farmers. In Area 'H', almost half of the lands remaining with subdivision potential are located within the ALR[7]. However, the review of recent ALC applications (since 2000) conducted for the *Existing Conditions Report* indicated a lack of support for subdivision at the provincial level, regardless of smaller minimum lot sizes conferred by local Subdivision Districts within the zoning bylaw. The ALC has noted in several decisions that subdividing farmland into parcels in the 2 – 5 ha range essentially reduces the viability of the land for farming. This is supported by the Regional District's data, which shows that smaller parcels are less likely to be farmed than larger parcels.

4.1 Deep Bay

This subarea (see Figure 1) has fairly large parcels of ALR. Farm Class status is conferred to parcels both within and outside of the ALR (see subarea Farm Class status maps in the Appendix). Most of the ALR has large minimum lot sizes (50 ha or 20 ha) in Deep Bay, although some parcels along the Old Island Highway have small minimum lot sizes (2 ha). These lots are larger than 2 ha currently. Very little active agriculture is occurring, with most of the ALR held in Crown land and forested.

[4] Growing our Future, Regional Agricultural Area Plan, 2012. Regional District of Nanaimo.
[5] Electoral Area 'H' Agricultural Bylaw and Policy Update Project. Draft Property Data Summary. Regional District of Nanaimo.
[6] Regional District of Nanaimo Regional Growth Strategy Bylaw No. 1615, 2011
[7] Electoral Area 'H' Agricultural Bylaw and Policy Update Project. Draft Property Data Summary. Regional District of Nanaimo.

4.2 Bowser & Qualicum Bay

The majority of ALR on the west/south side of the Old Island Highway in this subarea is Crown land (Figure 1). There are a number of ALR lots with small (2 ha) minimum lot sizes along the coastal side of the Old Island Highway, although the majority of these parcels are currently larger than this minimum and some have Farm Class status. The remaining ALR parcels in this subarea have minimum lot sizes of either 20 ha or 8 ha. At the northern end of this subarea, part of the ALR is located within a community park.

4.3 Dunsmuir

While much of this subarea has minimum lot sizes of 20 ha (and some as large as 50 ha), there are significant areas where the minimum lot size is reduced to 2 ha, particularly along Whistler Road. This may be leading to expectations of subdivision, as noted by the high levels of ALC applications arising from this subarea (refer to the *Existing Conditions Report* for a more detailed overview). Since 2000, the ALC has supported only one subdivision application in this subarea, in order to accommodate an infrastructure right-of-way. The 67-acre Arrowsmith Golf Course is located on ALR land within this subarea and is zoned Recreational. The majority of Area 'H' land with Farm Class status is located in this subarea as well, including 6 of the 9 parcels within Area 'H' that are located fully outside of the ALR.

4.4 Spider Lake & South of Inland Island Highway

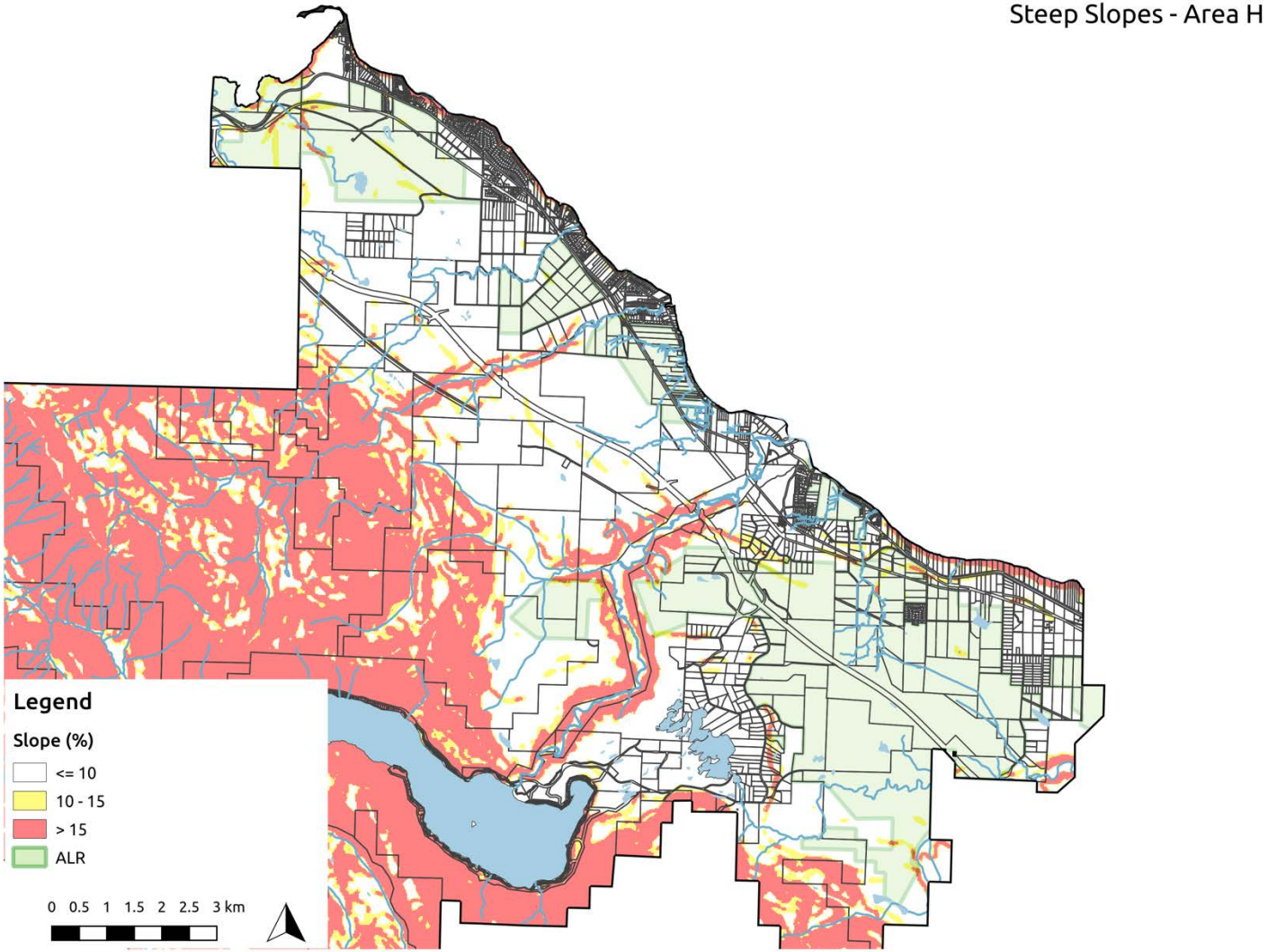
This subarea contains ALR land with minimum lots sizes of 20 ha and 8 ha. Most of the ALR lots are currently quite large (larger than 20 ha), and few have Farm Class status.

5.0 Topography

While flat or gently undulating land is ideal for soil-based farming, steep slopes are common in agricultural areas throughout Vancouver Island, and the Area 'H' is no exception. Many crops can withstand mild to moderately sloping land, and it can often benefit water drainage. However, extreme slopes can limit the ability for equipment to access land without fairly intensive modifications to the landscape, such as terracing. As noted in the *Existing Conditions Report*, the level of resolution of contour data available for this preliminary analysis was 20 m. While this provides a high-level determination of slope impact on a sub-area basis it does not account for site-specific topographical variations at the parcel level.

With these limitations in mind, the contour data was combined with ALR and parcel data to create a map that overlays the ALR with slopes of < 10%, 10-15%, and > 15% (Figure 2). Any slope greater than 15% is considered severely challenged for most agricultural operations. Results indicate that there are no slopes greater than 15% that overlap with ALR and very few areas where moderate (10-15%) slopes occur within the ALR in Area 'H'. These moderate slopes can most likely be attributed to waterways and other landscape features that occupy minor amounts of each parcel. While there were no ALC applications for exclusion in Area 'H' based on adverse topography noted since 2000, site-specific topographical challenges may exist that were unable to be characterized with 20 m contours.

Figure 2. Steep slopes and ALR in Area 'H'.



6.0 Soil Types and Agricultural Capability Ratings

Area 'H' is located in the Nanaimo Lowlands, which are characterized by northwest trending bedrock ridges, with narrow intervening valleys created by differential erosion of softer rock types. The principle waterways are the Qualicum River, Little Qualicum River, Nile Creek, and Thames Creek, all of which have floodplains, deltas, and estuaries. Gravelly fluvial, fluvio-glacial, and marine deposits are common along rivers and streams. The most common soil types[8] and their locations and characteristics are summarized in Table 3.

Table 3. Soil types, description, and location.

Soil Type	Description	Sub-Area	Agricultural Needs
Arrowsmith (AR)	Organic (peat) soil. Poorly drained, high water table.	Bowser & Qualicum Bay, Dunsmuir	Desirable peat for agricultural use as they have good tilth and permeability. Allow for good crop growth for vegetables, forage crops, and pasture.
Bowser (B)	Humo-Ferric Podzol. Gently undulating landscapes below 130 m elevation. Imperfectly to moderately poorly drained. Seasonally perched watertables. Stone-free, sandy loam or sandy soil.	Deep Bay, Bowser & Qualicum Bay, Dunsmuir, Spider Lake	Requires adequate drainage, irrigation, and fertilizers for a good production of a wide range of crops.
Cassidy (CA)	Regosol soil on coarse textured soils on level to gently sloping terraces and floodplains along river and creek valleys. Rapidly drained with a deep water table.	Spider Lake	Require stone-picking, irrigation, and fertilizers. Limited value for agriculture.
Dashwood (D)	Dystric Brunisol on sloping soils. Highly permeable upper soil horizons over till.	Deep Bay, Bowser & Qualicum Bay, Dunsmuir, Spider Lake	Limited use to soil-based agriculture due to coarse textures and low moisture holding capacity. Requires stone picking and irrigation.
Fairbridge (F)	Dystric Brunisol found below elevations of 100 m. Level to moderate slopes, imperfectly to moderately drained.	Dunsmuir	Prime agricultural land with dairy and hay being the predominant uses. Irrigation and fertilization required. Drainage will assist perennial crops.
Kaptara (KP)	Humic Gleysol on coarse-textured deposits. Minor in extent and occur in small areas associated with Qualicum soils. Poorly drained, located in seepage areas where drainage is restricted.	Bowser & Qualicum Bay, Dunsmuir, Spider Lake	Marginal for agricultural uses due to drainage and water table concerns.
Kye (KY)	Humo-Ferric Podzol on sandy deposits. Well to rapidly drained on level to moderate slopes. Stone-free and can be compacted or weakly cemented at depths.	Bowser & Qualicum Bay, Dunsmuir, Spider Lake	These soils can support a wide range of soil-based crops if irrigation is available.
Qualicum (Q)	Dystric Brunisols are developed on deep coarse-textured deposits. Rapidly drained with deep water table.	Bowser & Qualicum Bay, Dunsmuir	Marginal to unsuitable for soil-based agriculture. Limitations are sand, stones, and fertility.
Quinsam (QN)	Humo-Ferric Podzol are on sloping land above 100 m elevation. Moderately well drained.	Bowser & Qualicum Bay, Dunsmuir, Spider Lake	Most of these soils are under forest cover though some have been converted for pasture and hay production.

[8] Jungen, JR, Christie, PJ, and Philp, JP. 1989. Soils of Southeast Vancouver island: Parksville, Qualicum Beach, Courtenay, and Port Alberni Areas. BC Soil Survey Report No. 57. Ministry of Environment and Ministry of Agriculture and Fisheries. MOE Technical Report 30.

The 1:20,000 scale Canada Land Inventory (CLI) Agricultural Capability maps were assessed as part of this preliminary analysis for Area 'H'. The CLI rating system provides a classification of agricultural land using a scale of 1-7. Agricultural land with Classes 1-3 are considered prime and are able to support a diversity of soil-based agriculture. Classes 4-6 are marginal lands and are able to support specialized crops or non-soil based farming. Class 7 is generally unable to support farming and may include lakes, ponds, rocky outcrops, and other adverse topography. The CLI maps indicate a wide range of improved agricultural capability ratings in Area 'H', with the majority falling with the range of improved Class 2 to Class 4. The most common limitations associated with these ratings are stoniness, moisture (excessive wetness), droughtiness (need for irrigation), and smaller pockets of problems associated with soil structure. Within Area 'H', the most common improved agricultural capability ratings and limitations as associated with specific Agricultural Soil Management Groups[9] can be summarized as follows (Table 4):

Table 4. Agricultural soil management group, limitations, and subareas.

Subarea	Limitations	Agricultural Capability Ratings
Deep Bay	Droughtiness Low nutrient retention Coarse texture Temporary fluctuating perched watertables. Stoniness	Class 2 and Class 3
Bowser & Qualicum Bay	Droughtiness Low nutrient retention Coarse texture Temporary fluctuating perched watertables. Stoniness High watertables Organic subsidence, acidity, Low perviousness	Class 2, Class 3, Class 4
Dunsmuir	Droughtiness Low nutrient retention Coarse texture Temporary fluctuating perched watertables. Stoniness High perched watertables Susceptibility to compaction Organic subsidence, acidity, Low perviousness	Class 2, Class 3, Class 4, Class 5
Spider Lake and areas south of Inland Island Highway	Structure deterioration Cemented subsurface Adverse topography Droughtiness Low nutrient retention Coarse texture Stoniness High watertables Susceptibility to compaction Organic subsidence, acidity, Low perviousness	Class 1, Class 2, Class 3

[9] Agricultural Soil Management Groups. Thematic Mapping Unit. Surveys and Resource Mapping Branch, BC Ministry of Environment and Parks, 1986.

In the ALC's Boundary Review Procedure Manual (2013), lands with CLI Class 1-4 and lands with CLI Class 5-6 that are located in conjunction with Class 1-4 lands are deemed suitable for inclusion. Therefore, small areas of land with less favourable agricultural capability classification can still be deemed suitable for ALR inclusion if they are associated with lands that have higher classification ratings, in order to create cohesive agricultural landscapes. The ALC does not recommend or support the exclusion (removal) of these small amounts of Class 5-6 lands. Furthermore, Class 5-6 lands are suitable for perennial forage, seasonal grazing, ranching, nursery crops, or non-soil based agriculture such as greenhouse operations, land-based aquaculture, or indoor farming (e.g. medium to high intensity poultry farming and mushroom farming). Some Class 5 and 6 lands may also warrant inclusions into the ALR if they have unique characteristics, such as bogs for cranberry production.

The agricultural capability rating system does have its own limitations. It is not comprehensive enough to classify land for specialty crops. For instance, the East Coast of Vancouver Island has a Class 1 climate when soils are irrigated, but soils are often rated as Class 3, 4, or 5[10]. Therefore, the suitability of soils for particular crops needs to be considered. In addition, the need to consider opportunities for non-soil based farming must also be considered before a parcel of farmland is deemed unproductive. Farming is necessarily a business enterprise and viable farms may require land for expansion over time. Lands designated as Class 4, 5, or 6 may be improved over time and added to the productive base of the farm business operation.

7.0 Water Availability and Climate Change

The climate of the eastern coastal plain of Vancouver Island is characterized by cool wet winters and mild dry summers. The Pacific Ocean and Georgia Strait play a dominant role in moderating temperature, while Vancouver Island mountains control precipitation distribution. Peak precipitation occurs in November, December, and January and therefore soils are usually saturated, or at field capacity, at the start of the growing season in April/May. The months of July and August tend to be dominated by sunny, high pressure systems with low precipitation and mild to warm daily temperatures. In an average growing season, drought conditions are experienced on most moderately well to rapidly drained soils. This speaks to the need of many producers to require both drainage and irrigation installed in soil-based farming operations. As noted in the *Existing Conditions Report*, while many parcels within the ALR have groundwater wells registered through the BC Ministry of Environment, this registration is voluntary. Therefore, the number of existing wells is likely higher than the amount currently registered. As part of the ALUI conducted in 2012, irrigation was recorded throughout the entire Regional District and a water demand model was generated. In Area 'H', much of the irrigation activity was located around the Spider Lake subarea.

The 2012 ALUI was further used to develop an Agricultural Water Demand Model (AWDM) by the Ministry of Agriculture to understand current agricultural water use throughout the Province and help determine future demand. The model was used to calculate water use over the entire Regional District on a parcel-by-parcel basis to obtain a total water demand for the entire basin or sub-basin[11]. Crop, irrigation system type, soil texture, and climate data are then used to calculate the demand. Based on the AWDM, there were 4,441 ha of cultivated field crops across the entire Regional District (3,777 ha in the ALR and 663 ha outside the ALR). In 2012, the outdoor irrigated acreage in the ALR for the entire Regional District was 1,018

[10] Agricultural Land Commission, 2013. ALR Boundary Review Procedure Manual.
[11] BC Ministry of Agriculture. 2013. Agriculture Water Demand Model. Report for Regional District of Nanaimo. http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agricultural-land-and-environment/water/agriculture-water-demand-model/500300-9_agriculture_water_demand_model-nanaimo_report.pdf

ha or 23% of cultivated land. The amount of irrigated land was considered minimal due to in part to high water tables and crop types. The predominantly irrigated crop in the Regional District is forage (corn, grass, legume) and pasture via sprinkler and traveling gun. The AWDM calculated the amount of groundwater extracted in the Regional District to be an estimated 3.4 million m^3 per year. Based on water demand calculations, the annual irrigation for the Regional District can be expected to range from 3.1 million m^3 to 6.9 million m^3, depending on whether the year is particularly wet or dry.

To explore future trends, the AWDM considered a scenario if all the ALR in the entire Regional District were to be fully farmed. This additional irrigated land would be 3,111 ha, bringing the total irrigated area to 4,129 ha. Total water demand during a dry year would nearly quadruple to 26 million m^3, assuming efficient irrigation and good management. This scenario is only possible if ALR with agricultural capability Classes 4-6 were to come into production. Future trends in climate change and agriculture suggest that more Class 4 and 5 soils, which are uniquely suited to specialty crops such as fruit trees, nut trees, and berries, will become viable.

A report[12] published by the BC Agriculture and Food Climate Action Initiative in 2012 explored the possible impacts of climate change on livestock and horticulture crops on Vancouver Island. The report concluded that a relatively long growing season is possible for central and southern Vancouver Island because of the increasing number of frost free days. Precipitation is projected to increase in the spring, fall, and winter months, while decreasing in summer[13]. Warming temperatures in fall, winter and spring will mean that an increasing amount of the precipitation will fall as rain, while less falls as snow. Projections for Vancouver Island also suggest a relative sea level rise of 10–90 cm by 2100. Changes to precipitation patterns together with rising sea levels will shift the location of the fresh-saltwater interface further inland, potentially affecting groundwater in some areas.

Shifting hydrology patterns together with warmer and drier summer conditions will create the potential for increased productivity up to a point, depending on the adequacy of water supplies, drainage, and irrigation infrastructure. The AWDM calculates that, with these climate change scenarios in mind, demand could be greater than 29.5 million m^3. Given increasing precipitation in other seasons, this may be characterized as a need for water storage and access as opposed to an inadequate supply. Cost and coordination are limiting factors on the ability of individual producers to manage these conditions, however improved growing conditions may attract more producers to the region, making joint investment in infrastructure feasible.

[12] Crawford, E. and E. MacNair, 2012. Snapshot report: livestock and horticulture crops on Vancouver Island. BC Food and Agriculture Climate Action Initiative. http://www.bcagclimateaction.ca/wp/wp-content/media/AdaptROseries-VancouverIsland.pdf
[13] Ibid.

8.0 Agricultural Suitability

The ALUI conducted in 2012 provides information on the type and extent of existing agricultural activities in Area 'H'. This 2012 data was used in conjunction with a 2016 ground-truthing visit to determine the updated capacity for agricultural expansion, as well as to quantify the amount of land within the ALR that is unavailable for agriculture and the types of activities that are suitable to farmland in the region.

Based on the ALUI, there were 4,441 ha of cultivated field crops in the entire Regional District (3,777 ha in the ALR and 663 ha outside the ALR). On a per area basis, forage and pasture were the most common (4,087 ha, or 92% of all cultivated crops). The next highest crops per area were berries with 103 ha (100 ha in the ALR and 3 ha outside), tree plantations with 82 ha (24 ha in the ALR and 58 ha outside), and vegetables with 45 ha (31 ha in the ALR and 15 ha outside). It is interesting that only tree plantations had more acreage outside of the ALR than within the ALR.

When the parcels with crop cultivation were examined in more detail, several findings regarding the footprint of the crop on the parcels were made through the ALUI. In general, a fairly small amount of each parcel was actually being used for crop production. For instance, while there are 44 individual berry fields in the Regional District's inventory area they each have an average individual field crop area of only 2 ha and a median crop area of 0.4 ha. Fifty-nine individual vegetable fields were also recorded over the entire Regional District. These fields have an average crop area of 1 ha and a median crop area of 0.3 ha. This points to the ability for relatively small proportions of ALR parcels to be brought into production.

Further insight into production within Area 'H' is provided by the Census of Agriculture through Statistics Canada, which provides a breakdown of agricultural production and farm type for Area 'H' (most recently in 2011). The total number of self-reporting farms in Area 'H' in 2011 was 25 and nearly two-thirds (16 or 64%) were under 4 ha in size. While the amount of land covered by forage and pasture was highest, as noted in the ALUI, there were more operators focusing on poultry, berries, and vegetables than on forage production (Table 5) on a parcel by parcel basis.

Table 5. Number of farms by crop and livestock type in Electoral Area 'H'..

Crop/Livestock Type	Number of Farms
Poultry	15 (9 layers, 4 broilers, 2 turkeys)
Berries	10
Vegetables	8
Greenhouses	7
Goats or Sheep	6
Nursery	5
Forage, Grains, Oilseeds	4
Horses	4
Fruit trees	4
Cattle and calves	3
Sweet cherries	1
Christmas trees	1
Llamas and alpacas	1

Source: Statistics Canada, 2011.

To further get a sense of agricultural production and land cover in each subarea, Area 'H' was ground-truthed and results were compared to the 2012 ALUI maps for Area 'H' . The following observations on a sub-area basis are provided.

8.1 Deep Bay

Deep Bay is suitable for a range of soil-based and non-soil-based farming. Examples include nursery crops, tree plantations, small to medium scale cattle, sheep, goats, poultry, forage and pasture. In this subarea there are five lots with cultivated field crops consisting of forage and pasture, one tree farm, one nursery, and one lot growing grape vines, flowers, and rhubarb. There are a number of shellfish aquaculture tenures in and around Deep Bay, particularly in the foreshore areas to the northwest. Although no land-based aquaculture was noted, there is a shellfish processing facility within the ALR on the Island Highway. Approximately 10 ALR lots in Deep Bay appear to be available for agriculture, but are not currently being used for farming. These lots were mainly treed and very large but potentially could be cleared and be brought into production, as was the case for most existing farms in the area. Small pockets of land were unavailable for agriculture due to land cover (watercourses, paved surfaces, etc.). Only one ALR parcel in this area was under 2 ha in size.

8.2 Bowser and Qualicum Bay

In the Bowser and Qualicum Bay subarea, 52 lots are in the ALR, but are not currently used for farming. Four lots have cultivated field crops and all of these are used for forage and pasture. There is a potential in this subarea for an increase in both soil-based and non-soil-based agricultural production. Examples could include sheep, small to medium scale poultry, horse and hay, and other forage crops. Greenhouse operations, indoor farming, and land-based aquaculture are also suitable for this area. A total of ten lots were under 2 ha in size, six of which were less than 1 ha. However, three of these contain waterbodies. The small lots are all located on the coastal side of the Old Island Highway.

8.3 Dunsmuir

In the Dunsmuir subarea (which includes Grovehill Road, Boorman Road, Bayliss Road, and Oakdowne Road), approximately 89 lots are in the ALR, but are not being used for farming. These are a mix of large and small parcels with the large parcels mainly treed. At least 35 ALR lots contain cultivated field crops (30 lots are being used for forage and pasture, while three are producing vegetables). A total of seven lots are under 2 ha in size but five of these were part of a utility right-of-way and none are less than 1 ha. This area has potential for both soil-based and non-soil-based agriculture such as livestock grazing, poultry, forage crops, vegetables and berries, and greenhouses. It is expected that minimum to moderate amounts of improvements to soil (through amendments, drainage) and irrigation would be required to bring some of the land in this area into production.

8.4 Spider Lake

This subarea, which includes ALR land south of the Inland Island Highway has only a few parcels of Farm Class status, most of which are abutting the highway. Approximately 28 lots are in the ALR, but not being used for farming. A total of seven lots have limited potential for agriculture. Overall, the areas that are available for agriculture are large parcels that are further inland from the coast. Twelve lots are growing

forage and pasture, while three lots contain vegetable production. There are no lots under 2 ha in size. This subarea has potential for both soil-based and non-soil-based agriculture such as livestock grazing, poultry, forage crops, vegetables and berries, indoor farming, land-based aquaculture, and greenhouses. It is expected that moderate amounts of improvements to soil and irrigation would be required to bring this area into production and that larger lots will contain some pockets of unfarmable soil due to topography and/or stoniness. Soil drainage and non-soil based opportunities should be explored.

9.0 Summary of Findings

This report provides a comprehensive analysis to inform the ALR preliminary boundary review for Electoral Area 'H' within the Regional District of Nanaimo. The objective of the review is to provide increased confidence for decision-makers when determining whether certain areas should be included or excluded from the ALR. This analysis builds on the fine-tuning completed by the ALC in 1987, references the criteria used by the ALC during their boundary review exercises, and includes an examination of zoning, parcel size, topography, soil types and agricultural capability, water availability, and climate change.

Key findings include:

- While there are over 3,000 ha of land in the ALR within Electoral Area 'H', only about a third is under production and even less is irrigated.
- In terms of area, forage and pasture is the most common crop being cultivated followed by berries and fruit trees.
- Poultry, goats, sheep, horses, and alpacas are the livestock most often found on Area 'H' farms.
- Farmland parcel sizes are spread over all size categories, but there is a sizeable proportion that are under 5 ha (39%) although it represents only 5% of the total ALR by area.
- There are 37 parcels with BC Farm Class status conferred, 9 of which fall outside of the ALR. Of the parcels with Farm Class status, 16 (43%) are 5 ha or less in size.
- In terms of topography, there are no slopes greater than 15% that overlap with ALR and very few areas where moderate (10-15%) slopes occur within the ALR (these are mainly attributed to waterways and other landscape features that occupy minor amounts of each parcel).
- Soils are mainly Humo-Ferric Podzols and Dystric Brunisols over fluvial deposits.
- Improved agricultural capability ratings range from Class 1, 2, 3 (prime) to Class 4 and 5 (moderate) indicating that a range of crops can be produced if improvements such as drainage, irrigation, and fertilization are provided.
- The most common soil-based agricultural limitations include droughtiness, wetness, and stoniness.
- Access to water for irrigation is not a concern for the vast majority of ALR landowners.
- Climate change may lead to an increased need to store precipitation that falls during winter months to be used as irrigation during the growing season.
- An increase in frost free days may result in additional crop suitability on land that is currently classified as having moderate (Class 4 and 5) agricultural capability.
- Agricultural uses that may be suitable for farmland include soil-based and non-soil based activities, such as:
    - Forage production and pasture
    - Greenhouses
    - Poultry production
    - Mushroom farming

- Land-based aquaculture
- Sheep and/or goats
- Tree fruits
- Berry production

These findings, in addition to work completed for the *Existing Conditions Report*, are used to inform recommendations regarding the ALR Boundary Analysis for Electoral Area 'H'.

10.0 Recommendations

10.1 Potential Boundary Modifications

This preliminary analysis did not identify any portions of ALR that would meet the criteria for a block exclusion application to the ALC by the Regional District. The ability for a local government to submit a block exclusion application is conferred within the *Agricultural Land Commission Act* as per section 29(1). The recent decision[14] by the ALC regarding 43 parcels of land that were part of a block exclusion application by the City of Langford is worth examining to further provide context for the recommendation for the Regional District of Nanaimo not to pursue a block exclusion application.

The City of Langford's block exclusion application for 43 parcels within the ALR totalled 40 ha and included 29 parcels that were less than 1 ha (2 acres), and all parcels were less than 5 ha. The ALC's decision supported the exclusion of just 10.6 ha of the 40 ha request. Those 10.6 ha included parcels that were all either very small (less than 1 ha at the time of the ALR's inception in 1972) or were rights-of-way for roads that would allow for increased connection and transportation options for existing farms. In addition to parcel size and agricultural capability, the Panel considered the agricultural suitability of the properties which may take into account existing land use and surrounding land uses. Where a property under application was of a suitable size, or currently in agricultural use (commercial or hobby), or had no external factors impeding its use for agriculture now or in the future, the Panel found that the property was suitable for agriculture and should be retained within the ALR. This decision has implications for Area 'H', where 21 small (< 2 ha) ALR parcels exist, but only six are < 1 ha and three of these are waterbodies. The remaining three very small ALR lots are located within an area of Qualicum Bay that is surrounded by other ALR parcels with Farm Class status along the Old Island Highway, one of which is < 2 ha and has Farm Class status. Therefore, any exclusion or non-farm use application arising from these parcels should continue to be considered on a case-by-case basis.

Regarding inclusions, the ALR within Area 'H' could be made more contiguous if parcels were added into the ALR to connect existing ALR blocks between Deep Bay, Bowser, and Qualicum Bay. While existing water courses and other natural features may impede farming in some areas, an effort to connect isolated islands of ALR may help to reinforce long term planning while creating an additional level of support for existing farming operations. There are no differences in agricultural capability ratings between land in and outside of the ALR in these 'bridge' areas. Indeed, at least one large parcel outside of the ALR in this subarea has Farm Class status. A block inclusion application may be made by a local government as per section 17(1) of

[14] Agricultural Land Commission decision regarding the City of Langford block exclusion application, 2016. http://www.alc.gov.bc.ca/assets/alc/assets/applications-and-decisions/search-for-applications-and-decisions/2016-decision-minutes/54467d1.pdf

the *ALC Act* but would require the consent of all landowners in addition to a public hearing. All of the land identified as containing potential for inclusion are Crown land parcels.

Recommendation 1: Do not pursue a block exclusion application for ALR in Area 'H'.

Recommendation 2: Continue to assess ALR applications on a case-by-case basis.

Recommendation 3: Consider including parcels of Crown land in Deep Bay, Bowser, and Qualicum Bay to improve the contiguousness of ALR in the region.

10.2 Consistency in Minimum Lot Sizes

To further reduce the potential for conversion of viable ALR lands to non-farm uses, and to limit the amount of subdivisions occurring in the ALR, it is recommended that greater consistency between ALR, RGS and OCP land use designations is achieved and that an Agricultural Land Use designation is considered at both the RGS and OCP levels, similar to the Agriculture designation found in the OCP for Electoral Area 'A'. This recommendation is also included as action item 7.2D in the 2012 Agricultural Area Plan.

Similarly, the Regional District could strive for more consistency for agricultural lands within the Zoning Bylaw. The fact that very few parcels under 5 ha are being farmed should point to the discouragement of subdivision into ALR parcels less than 8 ha throughout Area 'H'. At the same time, very large parcels may discourage farming as well. Much of the ALR in parcels greater than 20 ha (both privately held and Crown land) is forested rather than farmed. It is recommended that a more consistent minimum subdivision of 8 ha (20 acres) be allotted for ALR throughout Area 'H'. A minimum lot size larger than 5 ha would also align with the history of subdivision decision-making by the ALC, which has not supported the parcelization of ALR except in special circumstances. It should be noted that the ALC has the final decision-making authority regarding subdivision applications regardless as to whether or not the application meets local minimum lot size requirements.

Recommendation 4: Use a consistent Agricultural Land Use designation in both the Regional Growth Strategy and Official Community Plan for all ALR in Electoral Area 'H'.

Recommendation 5: Create a consistent minimum lot size of 8 ha for ALR throughout Electoral Area 'H'. In parallel, support subdivision of lots greater than 20 ha when a net benefit to farming is demonstrated.

10.3 Support for Farmland Owners

Where constraints to soil-based agriculture are overly taxing within Electoral Area 'H', non-soil based agricultural activities remain an option. Many of the exclusion, non-farm use, and subdivision applications that were reviewed as part of the application history argued that soil capability was too challenging for farming. To be sure, there are landowners who have made efforts to farm their land and are struggling. These challenges should not be overlooked. It is therefore recommended that the Regional District partner with other levels of government and local farm organizations to disseminate information regarding farm business planning, farmland leasing, and other resources and opportunities for those who are struggling with the financial and/or business aspects of farming.

However, the lack of non-soil based farming activities is notable given the opportunities presented within Area 'H'. It is recommended that evidence of consideration of non-soil based farming opportunities be provided with all future applications submitted to the Regional District and/or forwarded to the ALC. The Regional District should encourage applicants who are unable or unwilling to farm their parcel to consider the options of selling or leasing farmland to individuals who are interested in undertaking agricultural production. Not only should a report from a Professional Agrologist continue to be included with future applications but these reports should consider and document opportunities for non-soil based agricultural endeavours including poultry, livestock, nursery, greenhouses/ polyhouses, mushrooms, land-based aquaculture, agroforestry, and other innovative approaches. The report should also specify how the proposed activities can employ best management practices (such as those published through the Ministry of Agriculture's Environmental Farm Plan) to minimize impacts on the surrounding environment.

It is therefore recommended that the Regional District cease forwarding exclusion, non-farm use, and/or subdivision applications to the ALC that are based on an agricultural suitability claim. In this same vein, repeat applications should no longer be forwarded by the Regional District to the ALC without this detailed level of assessment provided.

Recommendation 6: Partner with other levels of government and local farm organizations to disseminate information regarding existing resources and opportunities for business planning to proponents who are struggling with the business aspects of farming.

Recommendation 7: Require that non-soil based farming opportunities and environmental best practices be fully considered in Agrologist reports that accompany all future ALR applications being submitted to the Regional District.

Recommendation 8: Provide landowners who are unable or unwilling to farm with information regarding existing land tenure options (e.g. selling or leasing the farmland to potential farmers).

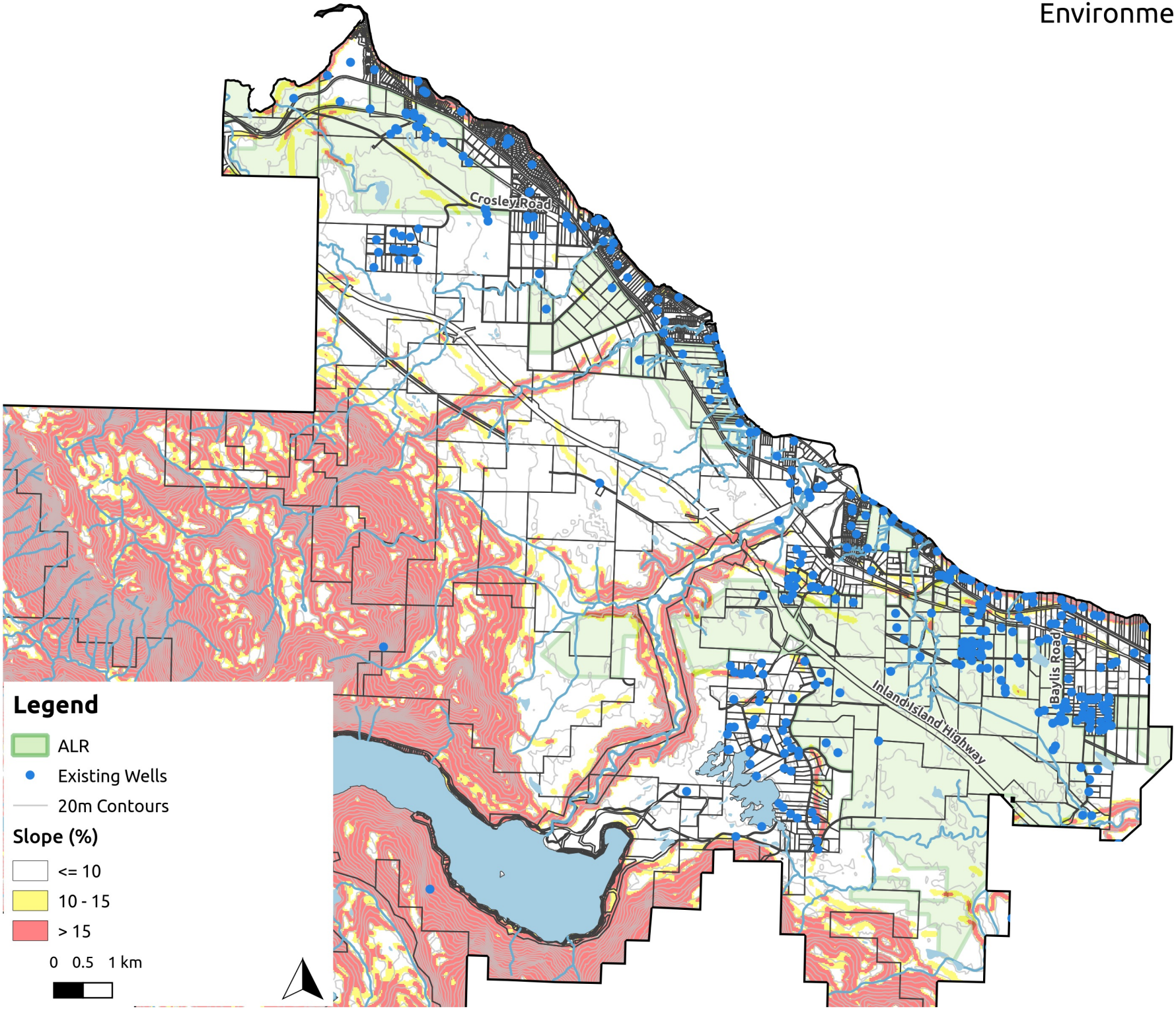
Recommendation 9: Cease forwarding ALR applications to the ALC that are based on claims of poor agricultural suitability or on challenges associated with the business aspects of agriculture.

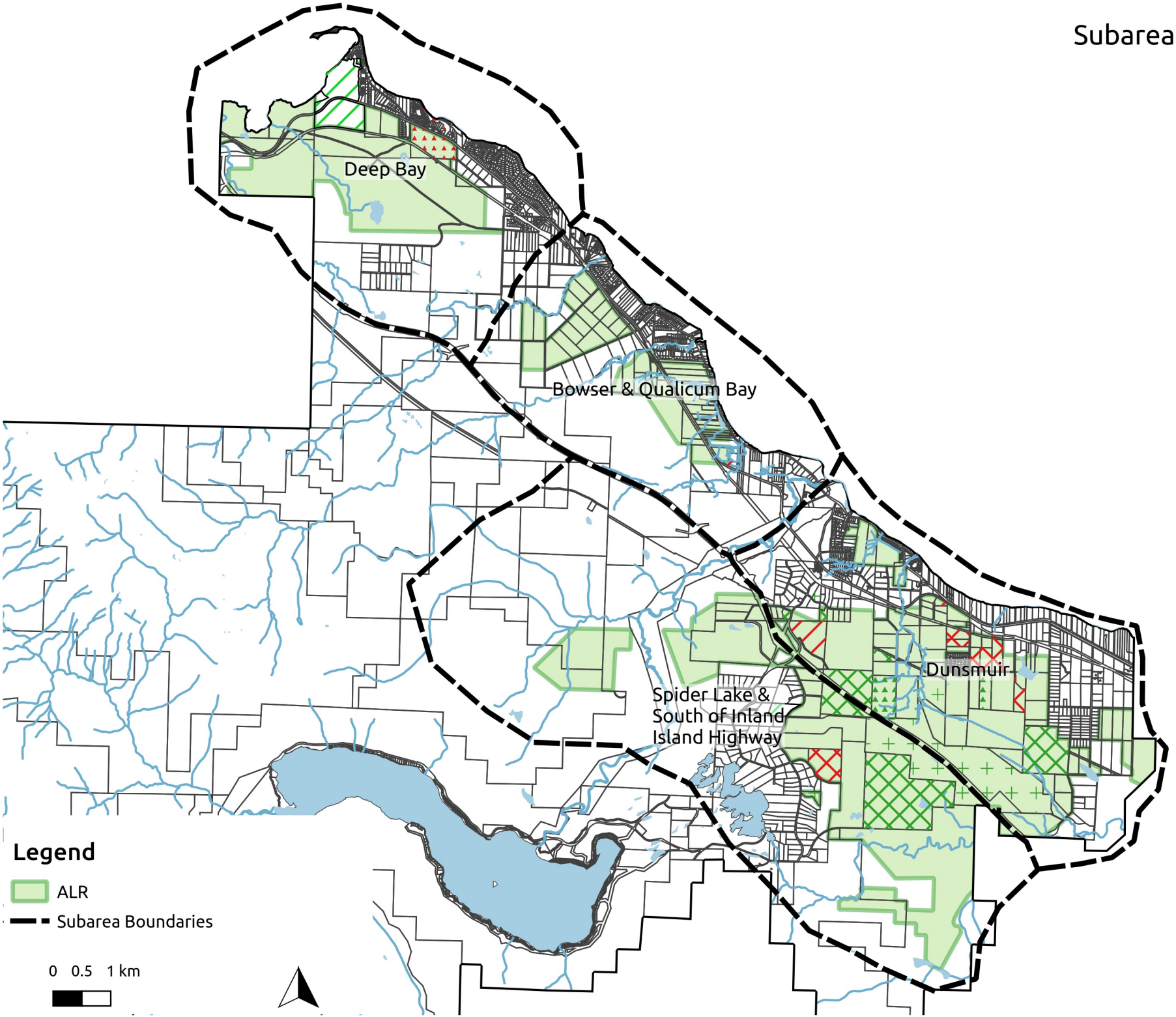
Appendix

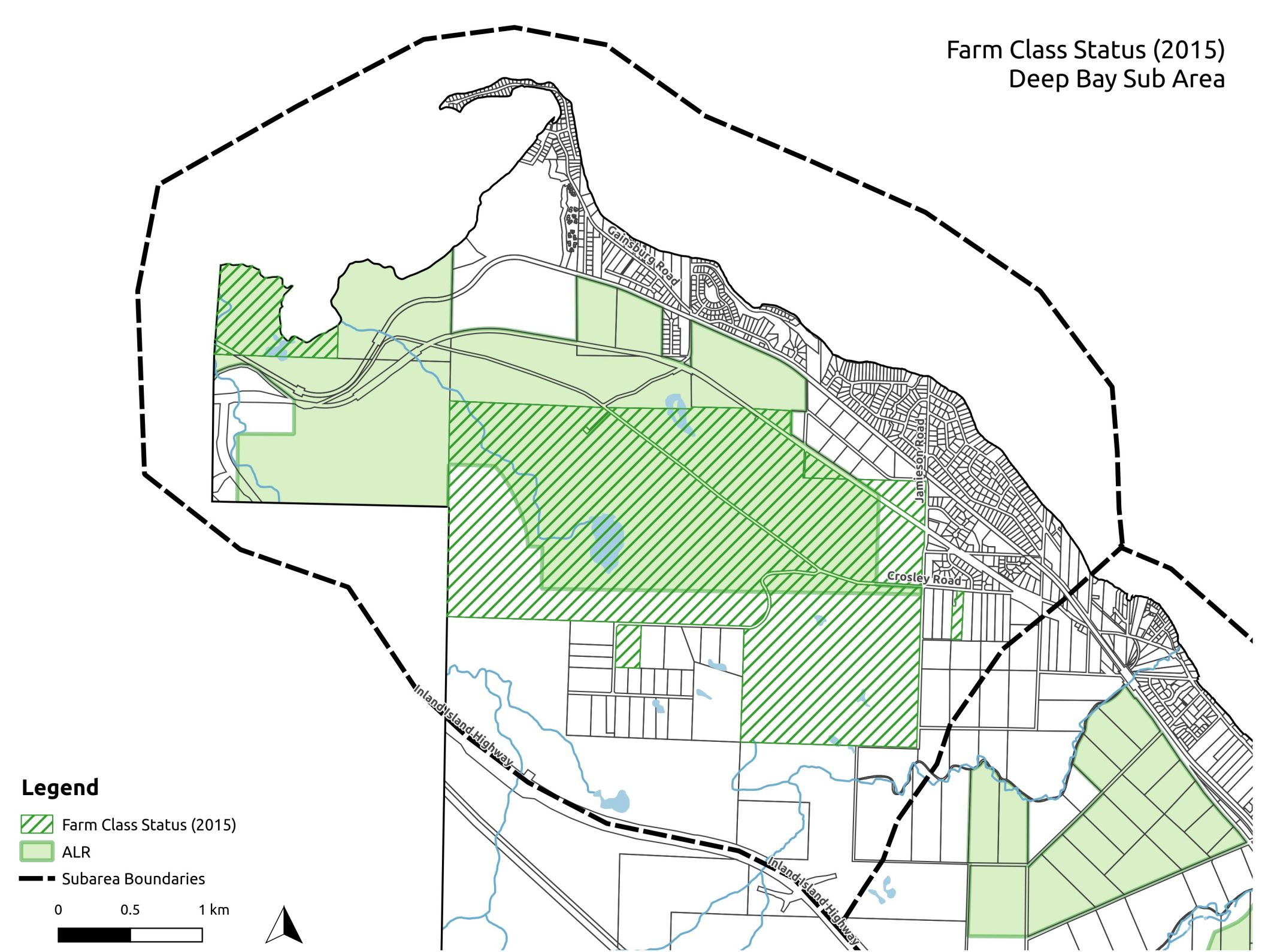
Maps:

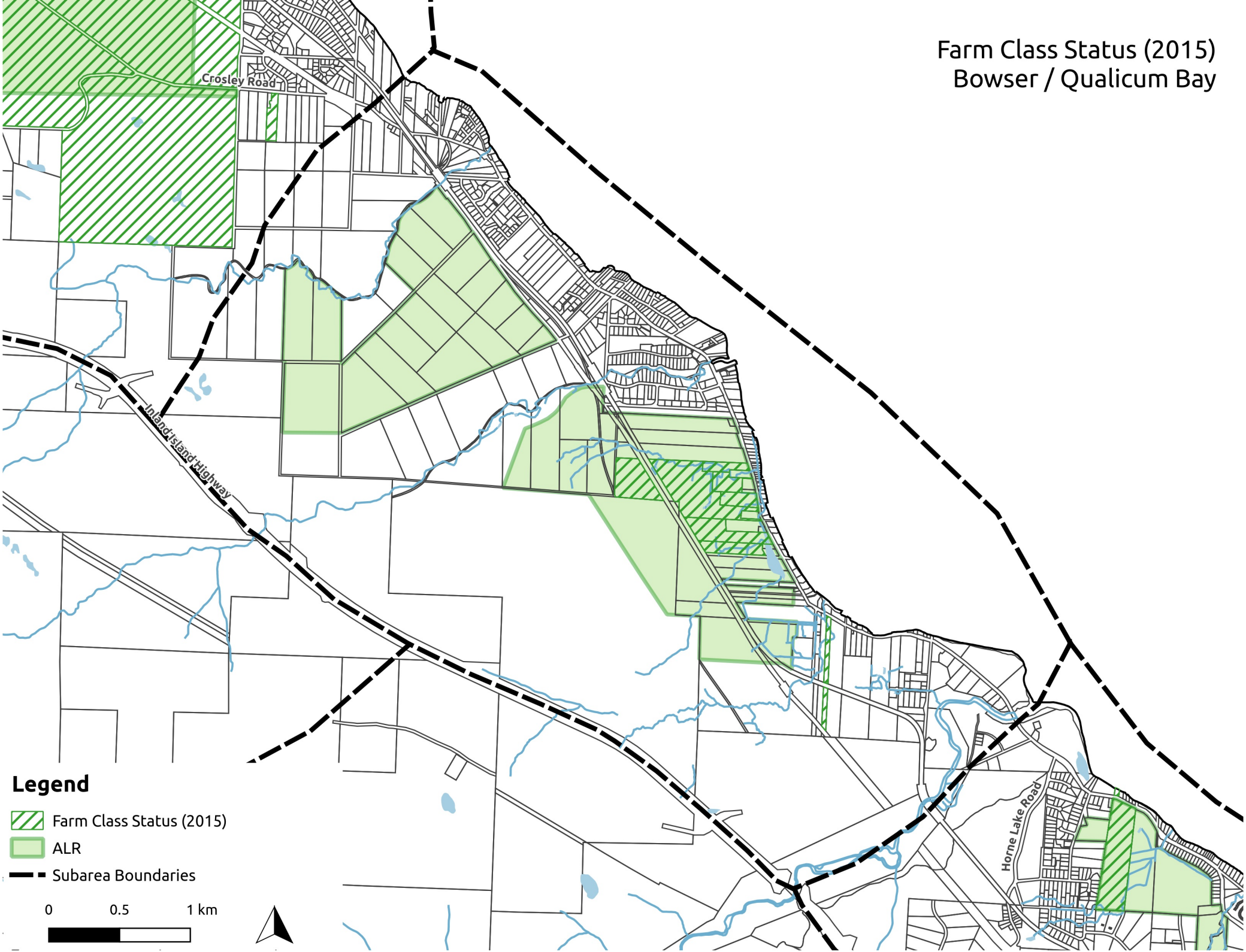
1) ALR and environmental features for Area 'H'
2) Subarea delineations
3) Farm Class status in Deep Bay subarea
4) Farm Class status in Bowser & Qualicum Bay subarea
5) Farm Class status in Dunsmuir subarea
6) Farm Class status in Spider Lake subarea
7) Application history in Deep Bay subarea
8) Application history in Bowser & Qualicum Bay subarea
9) Application history in Dunsmuir subarea
10) Application history in Spider Lake subarea

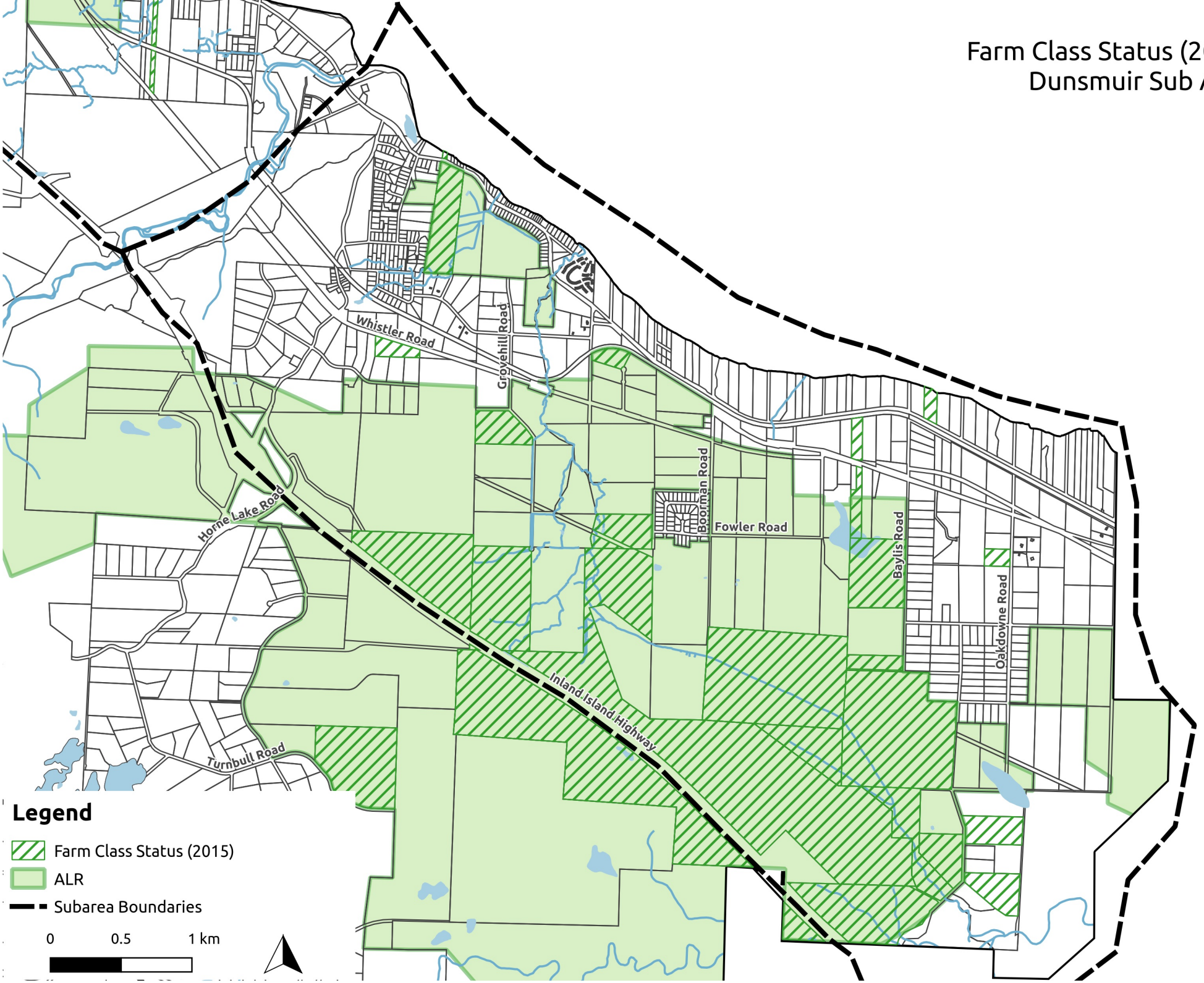
Environmental Features

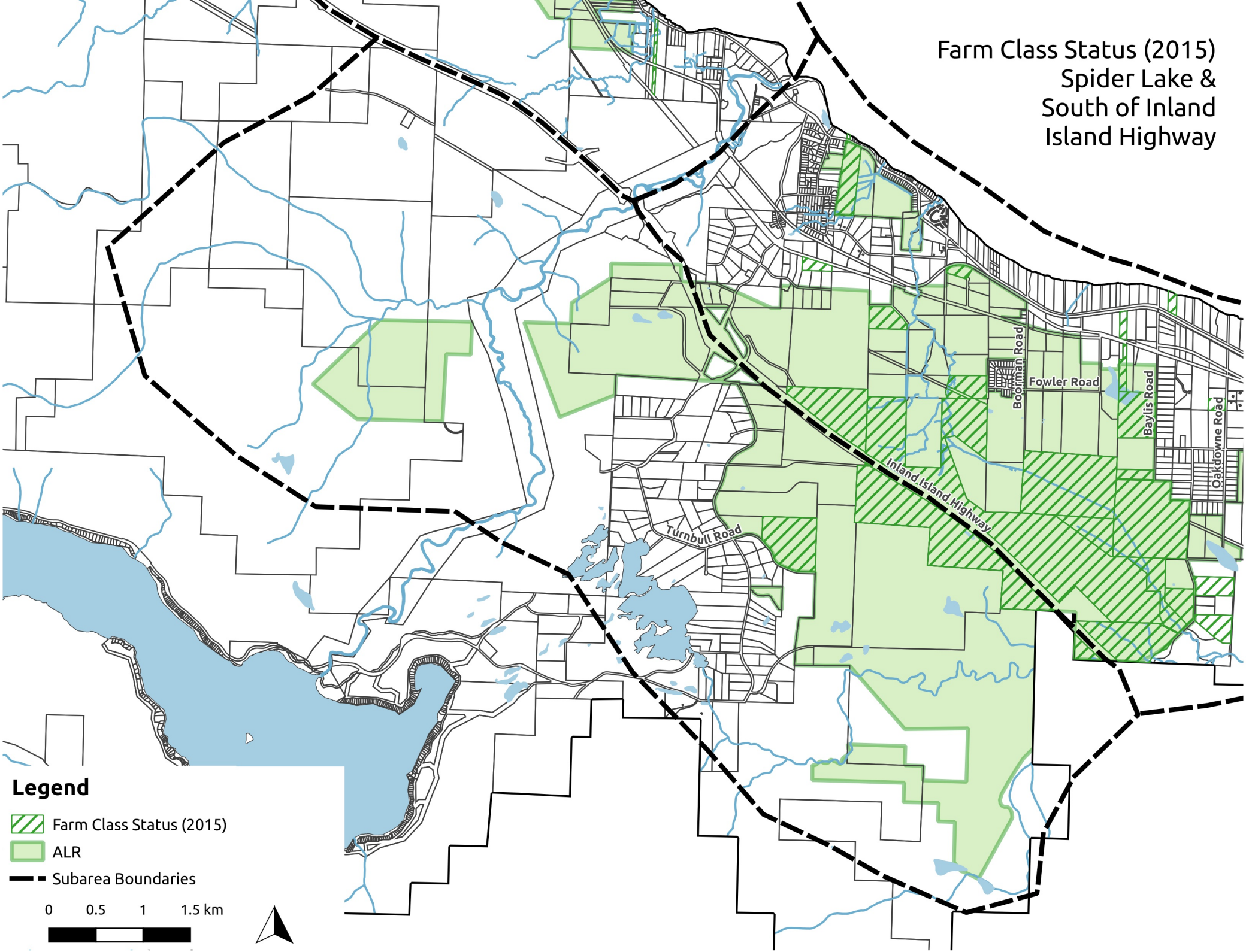



Subarea Boundaries
Deep Bay
Bowser & Qualicum Bay
Dunsmuir
Spider Lake &
South of Inland
Island Highway
Legend
ALR
Subarea Boundaries
0 0.5 1 km


Farm Class Status (2015)
Deep Bay Sub Area
Gainsburg Road
Jamieson Road
Crosley Road
Inland Island Highway
Inland Island Highway
Legend
Farm Class Status (2015)
ALR
Subarea Boundaries
0
0.5
1 km


Farm Class Status (2015)
Bowser / Qualicum Bay
Crosley Road
Inland Island Highway
Horne Lake Road
Legend
Farm Class Status (2015)
ALR
Subarea Boundaries
0
0.5
1 km


Farm Class Status (2015)
Dunsmuir Sub Area
Whistler Road
Grovehill Road
Horne Lake Road
Boorman Road
Fowler Road
Baylis Road
Oakdowne Road
Inland Island Highway
Turnbull Road
Legend
Farm Class Status (2015)
ALR
Subarea Boundaries
0
0.5
1 km


Farm Class Status (2015)
Spider Lake &
South of Inland
Island Highway
Boorman Road
Fowler Road
Baylis Road
Oakdowne Road
Inland Island Highway
Turnbull Road
Legend
Farm Class Status (2015)
ALR
Subarea Boundaries
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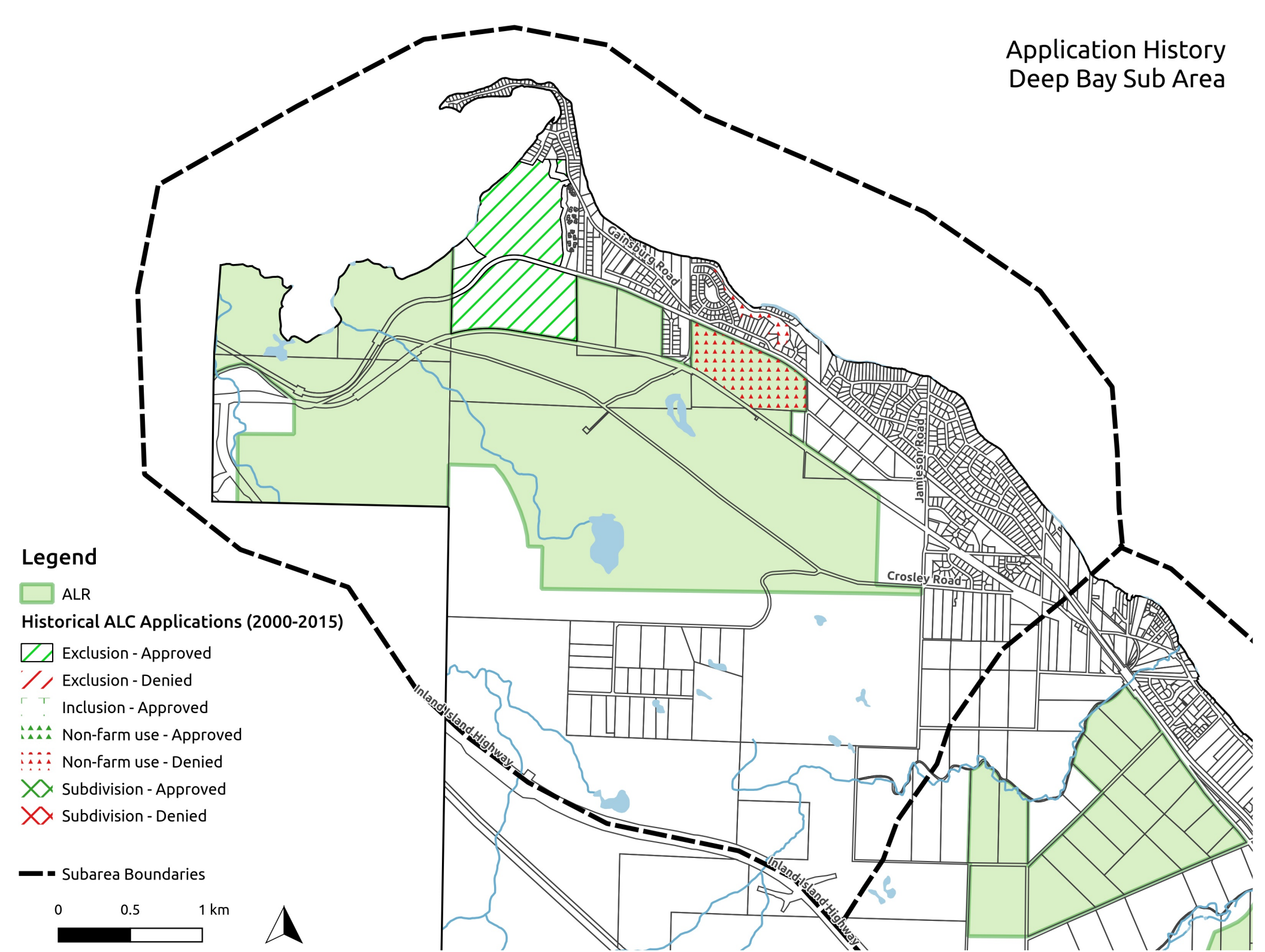
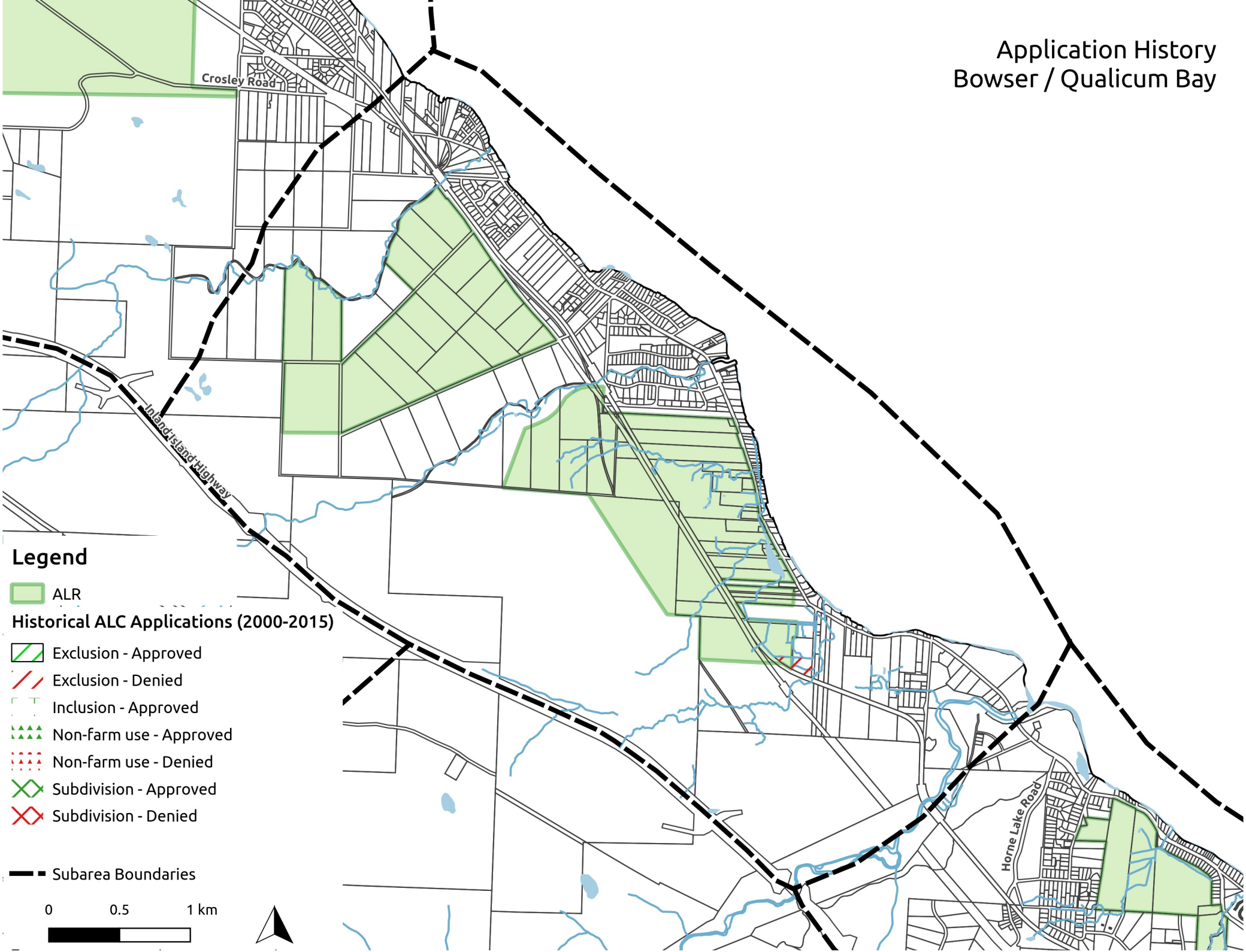
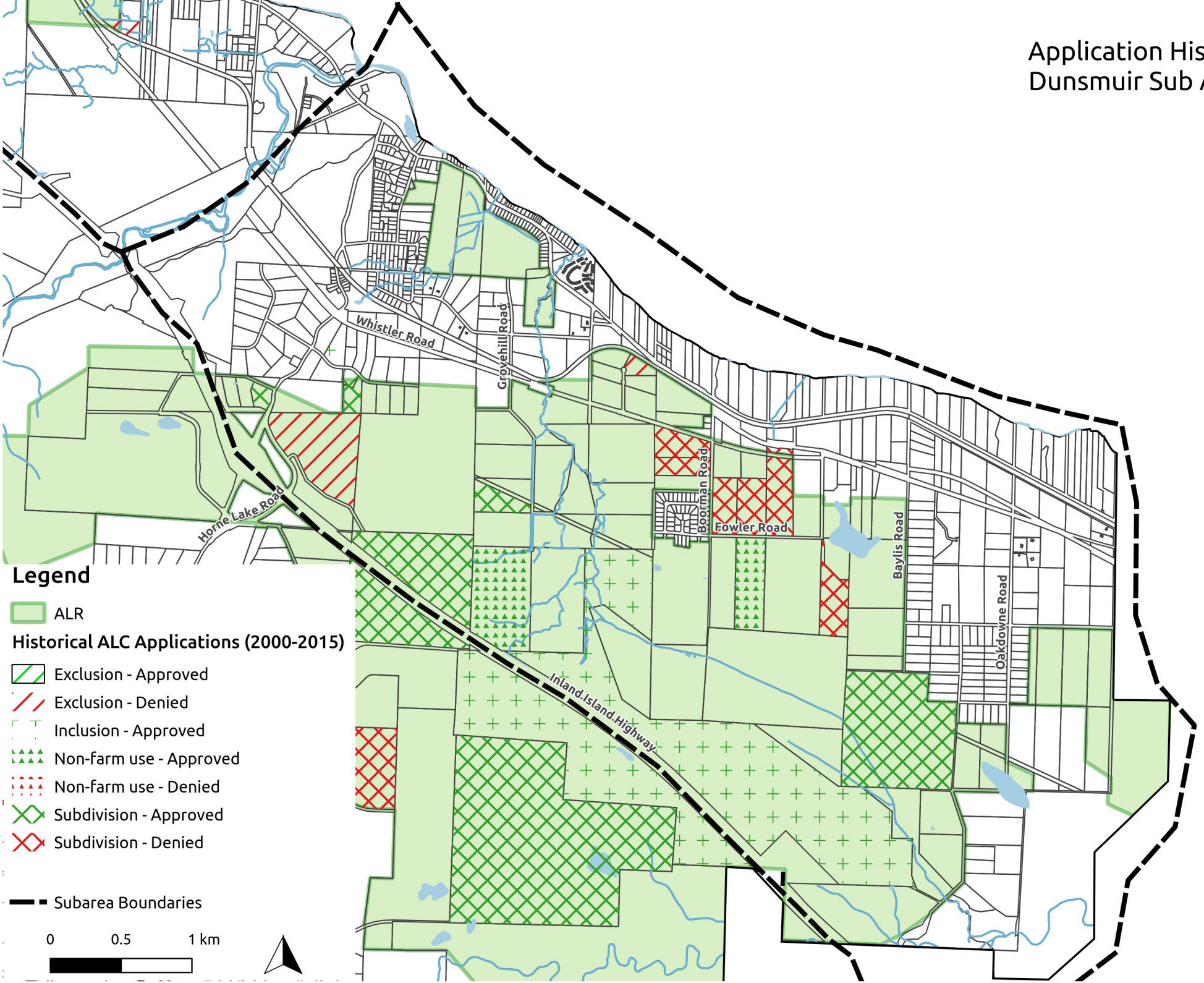
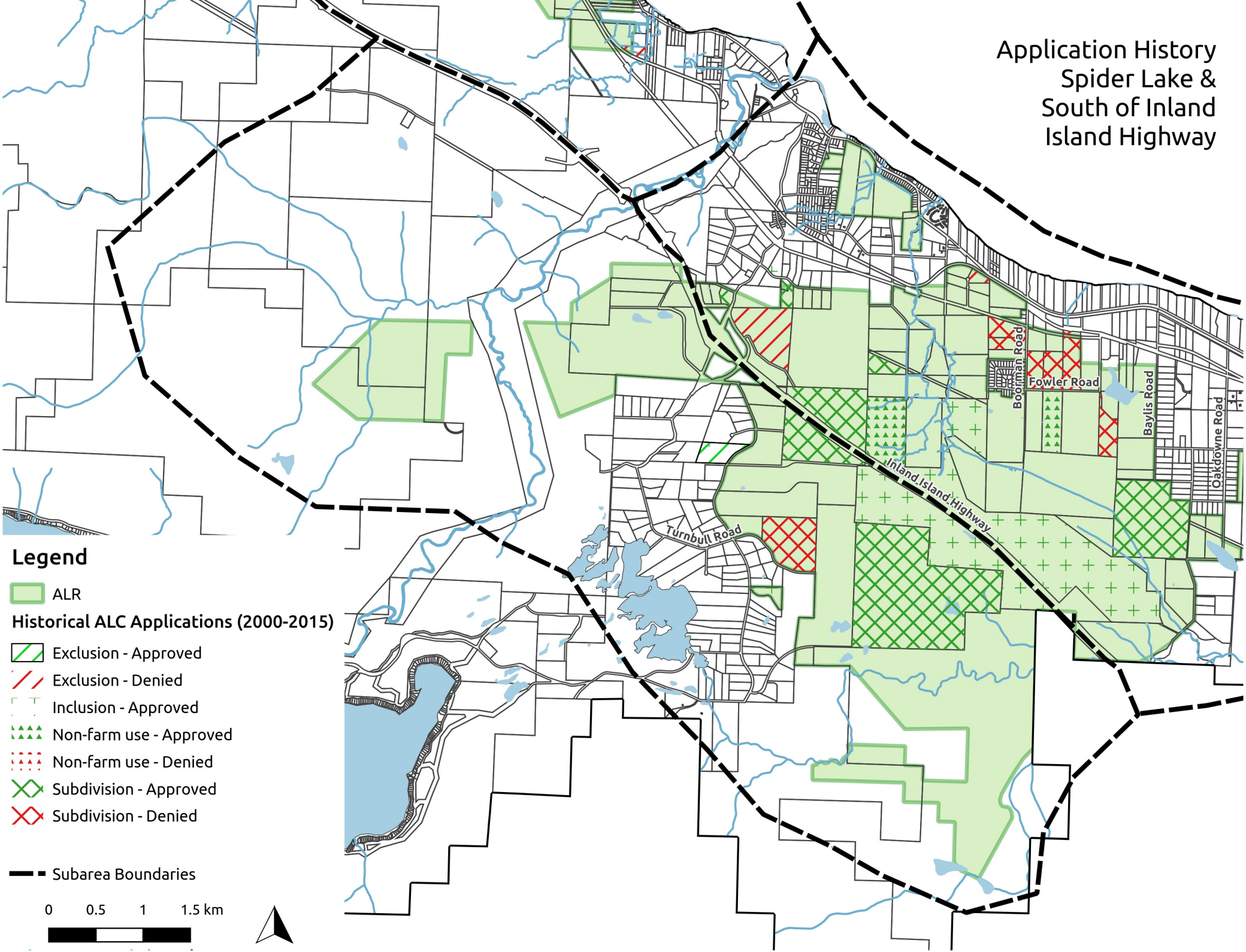
1.5 km


Application History
Deep Bay Sub Area
Gainsburg Road
Jamieson Road
Crosley Road
Inland Island Highway
Inland Island Highway
Legend
ALR
Historical ALC Applications (2000-2015)
Exclusion - Approved
Exclusion - Denied
Inclusion - Approved
Non-farm use - Approved
Non-farm use - Denied
Subdivision - Approved
Subdivision - Denied
Subarea Boundaries
0
0.5
1 km


Application History
Bowser / Qualicum Bay
Crosley Road
Inland Island Highway
Horne Lake Road
Legend
ALR
Historical ALC Applications (2000-2015)
Exclusion - Approved
Exclusion - Denied
Inclusion - Approved
Non-farm use - Approved
Non-farm use - Denied
Subdivision - Approved
Subdivision - Denied
Subarea Boundaries
0
0.5
1 km

Application History
Dunsmuir Sub Area




Application History
Spider Lake &
South of Inland
Island Highway
Legend
ALR
Historical ALC Applications (2000-2015)
Exclusion - Approved
Exclusion - Denied
Inclusion - Approved
Non-farm use - Approved
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Subdivision - Denied
Subarea Boundaries
0
0.5
1
1.5 km
Turnbull Road
Inland Island Highway
Boorman Road
Fowler Road
Baylis Road
Oakdowne Road